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AUTHOR	Meyer, Katrina A.
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ABSTRACT

The perception is that most studies on distance education or the use of technology are poorly designed or prone to incomplete analyses. This is true of the simple comparison study, where student outcomes are compared to those of students in a traditional course. Such studies are the basis for the often cited conclusion that there is no significant difference between online and traditional instruction. However, there are some very good studies of distance education. Some are qualitative, some are quantitative, and others are thoughtful or theoretical analyses of what is occurring in online courses. Much of the research on Web-based courses (whether these are comparison studies or case studies) indicates that online students do as well or better and are satisfied with their learning experiences. Ample interaction with material, students, and faculty, and constructivist learning situations enabled by the Web may be the key to this performance. Student learning may also depend on many individual qualities, and these individual differences may make it difficult to promote one approach as good for everyone. (Contains 27 references.) (SLD)

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DIGEST

Quality in Distance Education

Kathryn A. Meyer

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Quality in Distance Education
By Katrina A. Meyer

Introduction

What impact does distance education have on student learning? Is it more effective than traditional education? Less effective? Or about the same? Many studies that compare the two find no significant differences in learning and other outcome measures. The perception is that most studies on distance education or the use of technology are poorly designed and prone to incomplete analyses. That certainly is true of the simple comparison study, where student outcomes (such as course grades) for an online course are compared to those of a traditional course. This is the source of the "no significant differences" phenomenon, where possible intervening forces are ignored. Often, the researcher and instructor are the same person, further muddying the results. This design is flawed and the results are questionable.

However, there are some very good studies, some quantitative, others qualitative, and still others thoughtful or theoretical analyses of what is occurring in online courses. Some of these studies are quite creative and use interesting approaches to analyze the online course or the student learning resulting from using the Web in a course. Many of these studies would pass the harshest peer review criteria. Others are less complicated but no less worth reading.

It is unlikely we will ever unravel all of the factors that impact online learning. It is complex and its elements (the technology and the students) keep changing. Since we have not achieved a definitive answer on quality for more traditional classroom situations, perhaps it is unwise to expect such clarity for online learning. However, more understanding is always better, so the search for clarity will continue.

The No Significant Difference Phenomenon

Perhaps the most quoted and misunderstood body of research on distance education has been the work of Russell (1999), who reviewed 355 studies on distance education produced from 1928 to 1998. Some of the early studies examined correspondence courses, but most compared instruction over videotape, interactive video, or satellite with on-campus, in-person courses. Students were compared on test scores, grades, or performance measures unique to the study, and also on student satisfaction. Consistently, based on statistical tests, "no significant difference" between the comparison groups was found. However, only 40 of the 355 studies specifically included computer-based instruction, and the compilation was completed prior to the blossoming of courses using the Web.

It is important to understand the ramifications of Russell's work. Despite the technology used, the results are the same: no difference in student achievement. Russell concludes, "There is nothing inherent in the technology that elicits improvements in learning," although "the process of redesigning a course to adapt the content to the technology" can improve the course and improve the outcomes" (p. xiii). In other words, learning is not caused by the technology, but by the instructional method "embedded in the media" (Clark, 1994, p. 22). Technology, then, is "merely a means of delivering instruction," a delivery truck, so to speak, that does not influence achievement. Russell concludes, "No matter how it is produced, how it is delivered, whether or not it is interactive, low-tech or high-tech, students learn equally well" (p. xiv). Russell expressed his frustration that, after so many studies, people continue to believe that technology impacts learning.

Other Comparison Studies

Surprisingly, a large number of studies reviewed for the ASHE-ERIC Report upon which this Digest is based still compare student achievement between web-based versus in-person delivery models. Not surprisingly, the results of studies by Bourne, McMaster, Rieger, and Campbell (1997), Davies and Mendenhall (1998), Dominguez and Ridley (1999), Gagne and Shepherd (2001), Hahn et al. (1990), Johnson (2001), McNeill et al. (1991), Miller (2000), Mulligan and Geary (1999), Ryan (2000), Schulman and Sims (1999), Sener and Stover (2000), Serban (2000), Wegner, Holloway, and Garton (1999), Wideman and Owston (1999) remain largely the same as in Russell's compilation: comparing the two types of delivery methods leads to a conclusion of no significant difference in student achievement. However, several of these studies found differences in completion or student satisfaction, although final grades or exam scores were often the same, or nearly the same, between the two types of courses compared.

If the comparison studies (Russell, 1999) accomplished anything, they established that the technology studied did not make as much of a difference in the selected learning outcomes as some expected. This is due to the fact that interactive video (two-way audio and video conferencing) may sufficiently duplicate the traditional classroom teacher-centered model as to be indistinguishable from that model. Its instructional model is "one-to-many" whether delivered in person via lecture, television, or via interactive video. Or as Morrison (2001) remarked, "If you try to compare media, you have to keep the instruction constant. If you keep it constant, and the medium does not change the message/instruction, you will find no significant difference."

Other Study Results

Two studies are unique for their use of control variables. Kuh and Vesper (1999) analyzed data on 125,224 undergraduates and found that to the extent that the students became familiar with computers, there was a significant and positive association with self-reported gains in self-directed learning, writing, and problem solving (this study is unique for also having controlled for such factors as grades, age, gender, parental education, and educational aspirations). Another study by Flowers, Pascarella, and Pierson (2000) modeled on the Kuh and Vesper research focused on cognitive impacts of

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computer use during the first year of college. These results did not duplicate the positive results of Kuh and Vesper (1999), and while the impact on students at four-year colleges was nonsignificant, the results for community college students were positive, indicating a difference in the type of student enrolled in the two settings or their experiences while enrolled. Positive results were found for use of word processing in reading comprehension.

Areas for Further Research

While many aspects of using the web have been investigated, other issues have not. Research is needed into the usefulness or appropriateness of the web for different disciplines or learning objectives. Fahy (2000) calls this "technology's fitness for use" as a teaching tool, and asks – as others have asked — whether the technology is directly related to the learning outcome. Are some technologies more appropriate for visual-based disciplines and others better for discourse as Tuckey (1993) contends? Is the web good for lower-division courses, but inadequate for graduate seminars? And finally, what is the "best media mix" to achieve different learning goals (Harasim, 1996)? Or, as Barbules and Callister (2000) put the challenge, "*Which* technologies have educational potential for which students, for *which* subject matters, and for *which* purposes."

There may be an emerging answer to the series of "which" questions posed by Barbules and Callister. In early studies of K-12 students studying science reviewed by Helgeson (1988), the most effective combination of instructional opportunities included hands-on laboratory experiences and computer simulations, improving students' scientific thinking. This study is one of the first that drew attention to the possibility that a mix of media may be the most powerful means of education. Campos and Harasim (1999) found 55% of students prefer mixed-mode classes: those that combine face-to-face and online activities. Young (2002) describes "hybrid" teaching (or the "the convergence of online and resident instruction") at several universities, which one university president calls "the single-greatest unrecognized trend in higher education today." Dziuban and Moskal (2001) found that courses with both a web and face-to-face component produced the same or better success rates than courses that were fully online or face-to-face. This result teases us into asking whether there is some optimal combination of technologies – not limited to face-to-face, interactive video, and Web – that maximize learning based on the needs of the curriculum, the type of learning desired, and learner characteristics. Over time, the correct question to ask may not be which is better, but what combination is best.

Summary

Much of the research on Web-based courses (whether these are comparison studies or case studies) indicates that students do as well or better and are satisfied with their learning experiences. Ample interaction (with material, students, and faculty) and constructivist learning situations (e.g., project- and problem-based learning) enabled by the Web may be the key to this improved performance. But student learning may also depend on a number of individual qualities, including a positive attitude and motivation, independence and sufficient computer skills, as well as a predominantly visual learning style and an understanding that learning is not a passive process of absorbing information. These individual differences will make it difficult to promote any one approach as good for everyone.

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